REMARKS

Reconsideration and withdrawal of the objections to and rejections of the application are respectfully requested in view of the amendments and remarks herewith, which place the application into condition for allowance.

I. STATUS OF CLAIMS AND FORMAL MATTERS

Claims 1-8, 10-12 and 15-17 are now pending. Claims 1-8 and 10-12, along with the specification, were amended, claims 9, 13 and 14 cancelled and new claims 15-17 added, without prejudice.

Attached hereto is a marked up version of the changes made to the claims and the specification by the present amendment. This attachment is captioned "Version with Markings Showing Changes Made."

No new matter is added by this amendment.

It is submitted that these claims are patentably distinct from the prior art cited by the Examiner, and that these claims are in full compliance with the requirements of 35 U.S.C. §112. The amendments and remarks herein are not made for the purpose of patentability within the meaning of 35 U.S.C. §§ 101, 102, 103 or 112; but rather the amendments and remarks are made simply for clarification, to correct obvious typographical errors and to round out the scope of protection to which Applicants are entitled.

Support for the amended recitations in the claims and for the new claims are found throughout the specification and from the pending and cancelled claims.

II. 35 U.S.C. §112, SECOND PARAGRAPH, REJECTIONS

Claims 6 and 9 [sic] were rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. The rejection is traversed. Applicants initially note that claim 9 does not recite the term "preferably" and, as such, applicants believe that the Examiner intended to reject claim 10 instead.

The amendments to claims 6 and 10, without prejudice, have rendered the instant rejection moot. Further, applicants disagree with the allegation that the phrase "and derivatives thereof and stabilized and/or doped derivatives thereof" in claim 6 is unclear.

The Examiner is respectfully reminded that a claim is definite if the scope of the subject matter embraced by a claim is clear and if the applicant has not otherwise indicated that he intends the claims to be of a different scope. *In re Borkowski*, 164 U.S.P.Q. 642 (C.C.P.A. 1970). The "distinctly claim" requirement of 35 USC § 112, second paragraph, means that the claims must have a clear and definite meaning when construed in light of the complete patent document. *Standard Oil Co. v. American Cyanamid Co.*, 227 U.S.P.Q. 293 (Fed. Cir. 1985). The test of definiteness is whether one skilled in the art would understand the scope of the claim when read in light of the specification. *Morton Int. Inc. v. Cardinal Chem. Co.,* 28 U.S.P.Q.2d 1190 (Fed. Cir. 1993). The degree of precision necessary is a function of the subject matter claimed. *Hybritech Inc. v. Monoclonal Antibodies, Inc.,* 231 U.S.P.Q. 81, 94-95 (Fed. Cir. 1986). Indeed, the Federal Circuit noted in *Hybritech* that:

> '[I]f the claims, read in light of the specification, reasonably apprise those skilled in the art both of the utilization and scope of the invention, and if the language is as precise as the subject matter permits, the courts can demand no more' [and] the claims are clearly definite.

Id. at 94 (*citing to Shatterproof Glass Corp. v. Libbey Owens Ford Co.,* 225 U.S.P.Q. 634, 641 (Fed. Cir. 1985)) (emphasis added).

Applying the law to the instant facts, as the instant claims, read in light of the specification, apprise a skilled artisan of both the utilization and scope of the invention, and as the language **is as precise as the subject matter permits**, the instant claims are definite. A contrary conclusion, as posited by the Office Action, would not only be against public policy, but would also be impermissible as a matter of law. *See Hybritech*, 231 U.S.P.Q. at 95 ("As a matter of law, no court can demand more.").

More specifically, with respect to the allegations that the phrase "and derivatives thereof and stabilized and/or doped derivatives thereof" is indefinite, Applicants assert that these are common terms to one skilled in the art. Further, these terms are readily understood when read in light of the specification. *See Morton Int. Inc. v. Cardinal Chem. Co.,* 28 U.S.P.Q.2d 1190 (Fed. Cir. 1993) (noting that the test of definiteness is whether one skilled in the art would understand the scope of the claim when read in light of the specification).

Therefore, in view of the foregoing, reconsideration and withdrawal of the rejections under 35 U.S.C. §112, second paragraph, are respectfully requested.

III. 35 U.S.C. § 102 REJECTIONS

Claims 1-7 and 10-13 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 5,369,012 to Koontz et al. (the " '012 patent"); and claims 1-13 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 6,022,902 to Koontz et al. (the " '902 patent"). The rejections will be collectively addressed and are respectfully traversed.

The amendment to claim 1 with the recitations of cancelled claim 9 (claim 9 not rejected as being anticipated by the '012 patent), has rendered the Section 102 rejection based on the '012 patent moot.

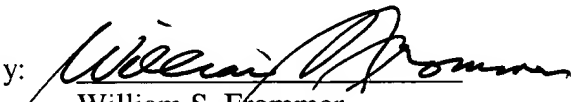
Further, the amendment to claim 1 also renders the rejection based on the '902 patent moot. The instant invention is a species of the genus purported in the '902 patent. More specifically, the time range recited in amended claim 1 (i.e., about 0.1 to 10 minutes) is a species of the genus purported in the '902 patent (i.e., 1 to 60 minutes). The Examiner is respectfully reminded that a species (or subgenus) may be patentably distinct from a genus. *See e.g., In re Baird*, 29 U.S.P.Q.2d 1550, 1551 (Fed. Cir. 1994) ("The fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound [unpatentable]."). *See also, In re Jones*, 21 U.S.P.Q.2d 1941, 1943 (Fed. Cir. 1992) (rejecting Commissioner's argument that "regardless [ ] how broad, a disclosure of a chemical genus renders [unpatentable] any species that happens to fall within it"). Thus, the instant rejection based on the '902 patent must be withdrawn as a matter of law.

Consequently, reconsideration and withdrawal of the Section 102 rejections are believed to be in order and such actions are respectfully requested.

CONCLUSION

By this Amendment, claims 1-8, 10-12 and 15-17 should be allowed; and this application is in condition for allowance. Favorable reconsideration of the application, withdrawal of the rejections and objections, and prompt issuance of the Notice of Allowance are, therefore, all earnestly solicited.

Respectfully submitted,
FROMMER LAWRENCE & HAUG LLP

By: 

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please amend page 3, line 23, to page 4, line 2, to read as follows:

In a preferred embodiment the nucleic acid is selected from the group [comprising] consisting of DNA, RNA, PNA (peptidic-NA), CNA (aminocyclohexylethane acid-NA), HNA (hexitol nucleic acids), p-RNA (pyranosyl-RNA), oligonucleotides, oligonucleotides of DNA, oligonucleotides of RNA, primers, A-DNA, B-DNA, Z-DNA, polynucleotides of DNA, polynucleotides of RNA, T-junctions of nucleic acids, domains of non-nucleic acid polymer-nucleic acid blockpolymers and combinations thereof. Suited non-nucleic acid polymers for blockcopolymers can be polypeptides, [sugar chains, like] polysaccharides such as cellulose, or artificial polymers, [like plastics] such as polyethylene glycol, and are generally known to the person skilled in the art.

Please amend page 4, line 20, to page 5, line 8, to read as follows:

The immobilization of the nucleic acid to the substrate can be adjusted by changing the intensity and duration of the plasma treatment. For example, using [a] short time/low pressure conditions (p_{O2}=0.4 mbar, t=4 min) leads to a weak binding of DNA molecules to the surface, whilst using [a] long-time/high-pressure conditions (p_{O2}=0.8 mbar, t=8 min) leads to a high density and strong binding of DNA molecules to the surface. These parameters correspond to a high-voltage power of 33 Watts at a frequency of 50 Hz. In the hands of the inventors [then] these parameters lead to optimal results in terms of the [time/power/cost] cost to benefit-ratio. The pressures and times given here are meant as non-limiting examples of the invention. In fact, higher power

levels can be used to reduce the minimum process time required to observe a significant binding effect. The individual protocols will vary depending on the machinery and the setup used for the immobilization process but can easily be determined by the person skilled in the art employing the general concept of the invention.

Please amend page 5, line 27, to page 6, line 8, to read as follows:

The nucleic acid herein referred to also as nucleic acid molecule may be either DNA or RNA. This interchangeability, which applies to many cases, resides in physiochemical similarities between DNA and RNA. Of course, any [polymers] nucleic acids or derivatives thereof can also be used in the present invention such as, but not limited to, oligonucleotides of DNA and RNA, respectively, primers thereof and polynucleotides of each of said two nucleic acid species. Additionally, nucleic acids which can be used in the present invention may show various confirmations such as A-DNA, B-DNA and Z-DNA which differ mostly in the diameter and the particular kind of helix structure. Also domains of nucleic acids within larger units may be used. It is to be understood that any of the aforementioned nucleic acid species may be either in [an] a [double-straind or single straind] double-stranded or single stranded form.

Please amend page 10, lines 4-7, to read as follows:

The fact that in figure 7 more DNA molecules per unit are found than in figure 6 and that in figure 7 the DNA molecules are less stretched, but more attached in a [zigg-zagg-like] zig-zag-like shape supports the idea that the regime "2" leads to a higher binding energy, thus to a more effective immobilization of DNA.

IN THE CLAIMS:

1. (Amended) [Process for immobilization of nucleic acid molecules on a substrate wherein the substrate is treated with atomic oxygen plasma prior to immobilizing the nucleic acid molecules thereon] A process for immobilizing nucleic acid molecules on a substrate, comprising the steps of:

a) treating said substrate for about 0.1 to 10 minutes with atomic oxygen plasma sprior to immobilizing said nucleic acids; and

b) immobilizing said nucleic acid molecules on said treated substrate.

2. (Amended) [Process] The process according to claim 1, [characterized in that] wherein the nucleic acid is selected from the group [comprising] consisting of DNA, RNA, PNA, CNA, RNA, HNA, p-RNA, oligonucleotides, oligonucleotides of DNA, oligonucleotides of RNA, primers, A-DNA, B-DNA, Z-DNA, polynucleotides of DNA, polynucleotides of RNA, T-junctions of nucleic acids, domains of non-nucleic acid polymer-nucleic acid blockpolymers and combinations thereof.

3. (Amended Twice) [Process] The process according to claim 1, [characterized in that] wherein the nucleic acid is double-stranded or single-stranded.

4. (Amended Twice) [Process] The process according to claim 1, [characterized in that] wherein the nucleic acid is of natural character, modified, such as substituted with functional groups, non-modified or artificially generated.

5. (Amended Twice) [Process] The process according to claim 1, [characterized in that] wherein the substrate is a single crystal surface or an amorphous surface.

6. (Amended) [Process] the process according to claim 5, [characterized in that the surface material is selected from the group comprising] wherein said single crystal surface and said amorphous surface are selected from the group consisting of silicon oxides, glass, aluminum oxides, sapphire, perovskites, [like $SrTiO_3$, $LaAlO_3$, ZrO_2] and derivatives and stabilized and/or doped derivatives thereof.

7. (Amended Twice) [Process] The process according to claim 1, [characterized in that] wherein microwave generated oxygen plasma producing atomic oxygen [or] from an oxygen gas or from a mixture of gases containing oxygen is used.

8. (Amended Twice) [Process] The process according to claim 1, [characterized in that] wherein high-voltage generated and/or UV-light emitting source generated oxygen plasma producing atomic oxygen [or] from an oxygen gas or from a mixture of gases containing oxygen is used.

10. (Amended Twice) [Process] The process according to claim 1, [characterized in that] wherein the atomic oxygen plasma treatment is carried out using an oxygen pressure in the range of about 0.1 to 1.0 mbar[, preferably 0.2 to 0.8 mbar].

11. (Amended Twice) [Process] The process according to claim 1, [characterized in that] wherein the nucleic acid to be immobilized on the substrate is present in an aqueous solution.

12. (Amended) [Process] The process according to claim 11, [characterized in that the substrate is treated with the nucleic acid containing aqueous solution, at least for a few seconds up to about 5 minutes, preferably 1 to 2 minutes] wherein the substrate is treated with said aqueous solution for about a few seconds to about 5 minutes.